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- 1 [Information filtering and query indexing for an information retrieval m](#)
 Christos Tryfonopoulos, Manolis Koubarakis, Yannis Drougas
 February 2009 **Transactions on Information Systems (TOIS)** , Volume 27
Publisher: ACM

Full text available: Pdf (1.23 MB) Additional Information: [full citation](#), [abstract](#), [reference](#)**Bibliometrics:** Downloads (6 Weeks): 126, Downloads (12 Months): 266, Citations

In the information filtering paradigm, clients subscribe to a server with IP addresses or profiles that express their information needs. Clients can also publish servers. Whenever a document is published, the continuous queries satisfied by the

Keywords: Information filtering, performance evaluation, query indexing, selective dissemination of information

- 2 [Efficient IP table lookup via adaptive stratified trees with selective re](#)
 Marco Pellegrini, Giordano Fusco
 June 2008 **Journal of Experimental Algorithmics (JEA)** , Volume 12
Publisher: ACM

Full text available: Pdf (218.61 KB) Additional Information: [full citation](#), [abstract](#), [reference](#)**Bibliometrics:** Downloads (6 Weeks): 8, Downloads (12 Months): 213, Citations

IP address lookup is a critical operation for high-bandwidth routers in packet networks, such as Internet. The lookup is a nontrivial operation, since it involves searching for the longest prefix, among those stored in a (large) given table.

Keywords: IP table lookup, data structures

- 3 [Efficient simulation of Internet worms](#)
 David M. Nicol
 April 2008 **Transactions on Modeling and Computer Simulation (TOMACS)** , Issue 2

Publisher: ACMFull text available: Pdf (616.44 KB) Additional Information: [full citation](#), [abstract](#), [reference](#)**Bibliometrics:** Downloads (6 Weeks): 21, Downloads (12 Months): 307, Citations**ADVANCED SEARCH** [Advanced Search](#)**FEEDBACK**

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Simulation of Internet worms (and other malware) requires tremendous resources when every packet generated by the phenomena is modeled. On the other hand, models of worm growth based on differential equations are significant ...

Keywords: Worms, denial-of-service, modeling, simulation

4 [High-performance packet classification algorithm for multithreaded IP processor](#)



Duo Liu, Zheng Chen, Bei Hua, Nenghai Yu, Xinan Tang

February 2008 **Transactions on Embedded Computing Systems (TECS)**

Publisher: ACM

Full text available: Pdf (1.17 MB) Additional Information: [full citation](#), [abstract](#), [reference](#)

Bibliometrics: Downloads (6 Weeks): 12, Downloads (12 Months): 174, Citations

Packet classification is crucial for the Internet to provide more value-added and guaranteed quality of service. Besides hardware-based solutions, many software classification algorithms have been proposed. However, classifying at 10 Gbps is still a challenge.

Keywords: Network processor, architecture, embedded system design, packet classification, thread-level parallelism

5 [P-ring: an efficient and robust P2P range index structure](#)



Adina Crainiceanu, Prakash Linga, Ashwin Machanavajjhala, Johannes Gehrmann, Shanmugasundaram

June 2007 **SIGMOD '07: Proceedings of the 2007 ACM SIGMOD international conference on Management of data**

Publisher: ACM

Full text available: Pdf (410.43 KB) Additional Information: [full citation](#), [abstract](#), [reference](#)

Bibliometrics: Downloads (6 Weeks): 8, Downloads (12 Months): 145, Citations

Peer-to-peer systems have emerged as a robust, scalable and decentral architecture for managing and publishing data. In this paper, we propose P-Ring, a new P2P index structure that supports both equality and range queries. P-Ring is fault-tolerant, provides

Keywords: load balancing, peer-to-peer systems, range queries

6 [CAMP: fast and efficient IP lookup architecture](#)



Sailesh Kumar, Michela Becchi, Patrick Crowley, Jonathan Turner

December 2006 **ANCS '06: Proceedings of the 2006 ACM/IEEE symposium on Architectures for networking and communications systems**

Publisher: ACM

Full text available: Pdf (636.29 KB) Additional Information: [full citation](#), [abstract](#), [reference](#)

Bibliometrics: Downloads (6 Weeks): 4, Downloads (12 Months): 48, Citations

A large body of research literature has focused on improving the performance of prefix match IP-lookup. More recently, embedded memory based architectures have been proposed, which delivers very high lookup and update throughput. These architectures

Keywords: IP lookup, internet router, longest prefix match

7 [High-performance packet classification algorithm for many-core and network processor](#)



Duo Liu, Bei Hua, Xianghui Hu, Xinan Tang

October 2006 **CASES '06**: Proceedings of the 2006 international conference on architecture and synthesis for embedded systems

Publisher: ACM

Full text available: [Pdf](#) (1.14 MB) Additional Information: [full citation](#), [abstract](#), [reference terms](#)

Bibliometrics: Downloads (6 Weeks): 8, Downloads (12 Months): 103, Citation

Packet classification is crucial for the Internet to provide more value-added guaranteed quality of service. Besides hardware-based solutions, many classification algorithms have been proposed. However, classifying at 10

Keywords: architecture, embedded system design, multithreading, network packet classification, thread-level parallelism

8 [A TCAM-based distributed parallel IP lookup scheme and performance analysis](#)

Kai Zheng, Chengchen Hu, Hongbin Lu, Bin Liu

August 2006 **IEEE/ACM Transactions on Networking (TON)**, Volume 14

Publisher: IEEE Press

Full text available: [Pdf](#) (883.08 KB) Additional Information: [full citation](#), [abstract](#), [reference terms](#)

Bibliometrics: Downloads (6 Weeks): 5, Downloads (12 Months): 89, Citation

Using ternary content addressable memory (TCAM) for high-speed IP address lookup has been gaining popularity due to its deterministic high performance. However, due to the slow improvement of memory accessing speed, the route lookup en

Keywords: IP, TCAM, power consumption, route lookup, throughput

9 [Chisel: A Storage-efficient, Collision-free Hash-based Network Processor Architecture](#)



Jahangir Hasan, Srihari Cadambi, Venkatta Jakkula, Srimat Chakradhar

June 2006 **ISCA '06**: Proceedings of the 33rd annual international symposium on computer architecture

Publisher: ACM

Full text available: [Pdf](#) (450.93 KB) Additional Information: [full citation](#), [abstract](#), [reference terms](#)

Bibliometrics: Downloads (6 Weeks): 12, Downloads (12 Months): 83, Citation

Longest Prefix Matching (LPM) is a fundamental part of various network forwarding algorithms. Previously proposed approaches for LPM result in prohibitive cost and power consumption (TCAMs) or in large memory requirements and long lookup latencies (tr

Keywords: IP Lookup, Packet Classification, Hash Tables, Bloom Filters, Longest Prefix Matching.

Also published in:

May 2006 **SIGARCH Computer Architecture News** Volume 34 Issue 2

10 Longest prefix matching using bloom filters

Sarang Dharmapurikar, Praveen Krishnamurthy, David E. Taylor

April 2006 **IEEE/ ACM Transactions on Networking (TON)** , Volume 14 Issue 2

Publisher: IEEE Press


Full text available:  Pdf (487.30 KB) Additional Information: full citation, abstract, references, index terms

Bibliometrics: Downloads (6 Weeks): 8, Downloads (12 Months): 78, Citation

We introduce the first algorithm that we are aware of to employ Bloom filter prefix matching (LPM). The algorithm performs parallel queries on a efficient data structure for membership queries, in order to determine a


Keywords: Bloom filter, IP lookup, computer networking, longest prefix

11 Adaptive data structures for IP lookups

 Ioannis Ioannidis, Ananth Grama, Mikhail Atallah

December 2005 **Journal of Experimental Algorithmics (JEA)** , Volume 10 Issue 1

Publisher: ACM


Full text available:  Pdf (258.90 KB) Additional Information: full citation, appendices and abstract, references, index terms

Bibliometrics: Downloads (6 Weeks): 6, Downloads (12 Months): 84, Citation

The problem of efficient data structures for IP lookups has been well studied in the literature. Techniques such as LC tries and extensible hashing are common. In this paper, we address the problem of generalizing LC tries, based on traces


Keywords: IP lookups, level compression

12 Overcoming the memory wall in packet processing: hammers or ladders?

 Jayaram Mudigonda, Harrick M. Vin, Raj Yavatkar

October 2005 **ANCS '05: Proceedings of the 2005 ACM symposium on Architectures for networking and communications systems**

Publisher: ACM

Full text available:  Pdf (207.39 KB) Additional Information: full citation, abstract, references, index terms

Bibliometrics: Downloads (6 Weeks): 19, Downloads (12 Months): 69, Citation

Overhead of memory accesses limits the performance of packet processing. To overcome this bottleneck, today's network processors can utilize a wide variety of mechanisms-such as multi-level memory hierarchy, wide-word accesses, and cache coherency mechanisms-for the purpose of ...


Keywords: data-caches, multithreading, network processors

13 Hardware-based IP routing using partitioned lookup table

Mohammad J. Akhbarizadeh, Mehrdad Nourani

August 2005 **IEEE/ ACM Transactions on Networking (TON)** , Volume 13 Issue 4

Publisher: IEEE Press

Full text available:  Pdf (580.38 KB) Additional Information: full citation, abstract, referer terms


Bibliometrics: Downloads (6 Weeks): 6, Downloads (12 Months): 64, Citation

We present a search algorithm implementable by a parallel architecture partitioned forwarding table. This scheme effectively reduces the complexity of "the longest prefix match" problem to "a prefix match" problem. The m...

Keywords: IP address, content addressable memory, forwarding table, longest prefix matching, partitioned forwarding

14 Scalable, memory efficient, high-speed IP lookup algorithms

Rama Sangireddy, Natsuhiko Futamura, Srinivas Aluru, Arun K. Somani
August 2005 **IEEE/ ACM Transactions on Networking (TON)** , Volume 13
Publisher: IEEE Press

Full text available:  Pdf (699.74 KB) Additional Information: full citation, abstract, referer terms

Bibliometrics: Downloads (6 Weeks): 8, Downloads (12 Months): 92, Citation

One of the central issues in router performance is IP address lookup based on prefix matching. IP address lookup algorithms can be evaluated on a number of factors: lookup time, update time, memory usage, and to a less important extent...

Keywords: IP packet forwarding, address lookups, longest prefix matching, tables, scalability

15 Fast incremental updates for pipelined forwarding engines

Anindya Basu, Girija Nartikar
June 2005 **IEEE/ ACM Transactions on Networking (TON)** , Volume 13
Publisher: IEEE Press


Full text available:  Pdf (941.54 KB) Additional Information: full citation, abstract, referer terms

Bibliometrics: Downloads (6 Weeks): 1, Downloads (12 Months): 49, Citation


Pipelined ASIC architectures are increasingly being used in forwarding engines of high-speed IP routers. We explore optimization issues in the design of memory structures that support fast incremental updates in such forwarding engines.

Keywords: core routers, packet forwarding, pipelined IP lookup, router

16 A Tree Based Router Search Engine Architecture with Single Port Memory

 Florin Baboescu, Dean M. Tullisen, Grigore Fosu, Sumeet Singh
June 2005 **ISCA '05: Proceedings of the 32nd annual international symposium on computer architecture**

Publisher: ACM

Full text available:  Pdf (293.29 KB) Additional Information: full citation, abstract, referer terms

Bibliometrics: Downloads (6 Weeks): 12, Downloads (12 Months): 62, Citation

Pipelined forwarding engines are used in core routers to meet speed de
based searches are pipelined across a number of stages to achieve high
this results in unevenly distributed memory. To address this imbalance,

Also published in:


May 2005 **SIGARCH Computer Architecture News** Volume 33 Issue 2

17 Scalable packet classification

Florin Baboescu, George Varghese

February 2005 **IEEE/ ACM Transactions on Networking (TON)** , Volume 13


Publisher: IEEE Press

Full text available:  Pdf (501.73 KB) Additional Information: full citation, abstract, refer
terms, review

Bibliometrics: Downloads (6 Weeks): 5, Downloads (12 Months): 82, Citation


Packet classification is important for applications such as firewalls, intru
and differentiated services. Existing algorithms for packet classification
literature scale poorly in either time or space as filter databases ...

18 Processing XML streams with deterministic automata and stream inc

 Todd J. Green, Ashish Gupta, Jerome Miklau, Makoto Ouzuka, Dan Suciu

December 2004 **Transactions on Database Systems (TODS)** , Volume 29 I

Publisher: ACM


Full text available:  Pdf (717.00 KB) Additional Information: full citation, appendices and
abstract, references, cited b

Bibliometrics: Downloads (6 Weeks): 20, Downloads (12 Months): 161, Citat

We consider the problem of evaluating a large number of XPath express
of XML packets. We contribute two novel techniques. The first is to use
Deterministic Finite Automaton (DFA). The contribution here is to show


Keywords: XML processing, stream processing

19 Parallelism versus memory allocation in pipelined router forwarding

 Fan Chung, Ronald Graham, George Varghese

June 2004 **SPAA '04: Proceedings of the sixteenth annual ACM symposium
algorithms and architectures**

Publisher: ACM


Full text available:  Pdf (194.18 KB) Additional Information: full citation, abstract, refer
terms

Bibliometrics: Downloads (6 Weeks): 1, Downloads (12 Months): 21, Citation

A crucial problem that needs to be solved is the allocation of memory to
pipeline. Ideally, the processor memories should be totally separate (i.e
memories) in order to minimize contention; however, this minimizes me

Keywords: approximation algorithm, memory allocation

20 Tree bitmap: hardware/software IP lookups with incremental updates

 Will Eatherton, George Varghese, Zubin Datta

April 2004 **SIGCOMM Computer Communication Review** , Volume 34 Issue

Publisher: ACM

Full text available:  Pdf (189.39 KB) Additional Information: full citation, abstract, refere

Bibliometrics: Downloads (6 Weeks): 14, Downloads (12 Months): 87, Citation

Even with the significant focus on IP address lookup in the published literature, focus on this market by commercial semiconductor vendors, there is still router architects to find solutions that simultaneously meet 3 criteria: ..

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